CHAPTER 12

SHOP SAFETY

GENERAL WORK AREA

Every effort should be made to improve safety conditions in the shop. Always be on the alert for unsatisfactory conditions that could injure personnel or damage equipment. Conduct preventive maintenance and periodic inspections to keep the shop safe and efficient. The following are some general guidelines to remember:

- Keep your work area clean, orderly, and free of obstructions; you may trip or injure yourself because of a misplaced extension cord or dropped tool. A cluttered bench makes effective work almost impossible.
- Reassemble units properly. Some units that you will disassemble consist of small parts that can easily be lost, broken, or mixed with other parts. A unit improperly reassembled or one reassembled with defective parts is the starting place for an aircraft accident.
- Dispose of worn-out parts in designated places--not on the floor.
- Keep toolboxes in their designated places and keep the lids closed.
- Use tools for their designed purposes only, and keep them in a good state of repair. Common hand tools are a frequent source of injury. For guidance on use and care of hand tools, see TM 9-243.
- Use the proper guards when working in the shop. Whenever possible, guards should be permanently installed. Machines with movable guards should have a power cutoff switch installed.
- Become familiar with the color codes used on power equipment--red indicates danger or identifies emergency stop-devices, yellow indicates caution, and green identifies safety equipment facilities. Black and white are used for informational signs.

HAZARDOUS WORK AREA

Although hazards exist in some areas where you work, you can reduce the danger to yourself by being careful. Observe the following precautions:

- Do not stand in line with the turbine wheel during engine run-up.

- Do not pass close behind an aircraft when its engine is running. The high-velocity, high-temperature exhaust blast of a turbine engine is especially hazardous to personnel.

- Do not approach jet intakes when the engine is operating. The intake ducts should be free of all objects.

- Protect yourself against harmful noise levels. Noise endangers a person's hearing, makes speech communication almost impossible, and is tiring. All of these factors contribute to faulty maintenance which, in turn, contributes to maintenance errors. Noise levels above 85 decibels are extremely hazardous. Do not expose yourself to such high-level noise unless absolutely necessary; if you must do so, keep the period of exposure as short as possible. Wear a headset and earplugs. Earplugs alone will not give you enough protection at these high levels. You should know the physical symptoms that indicate overexposure to loud noise. A person who has worked too long under high-noise-level conditions will show symptoms of sickness: pain, a feeling of fullness, a ringing sound, or a burning sensation in the ear; dizziness, slowed mental concentration, nausea, vomiting, or weakness of the knees. When any of these symptoms occur, remove the affected person from the noise area immediately. A medical officer should examine him before the effects wear off.

- When working around radar equipment and other microwave equipment, be sure that the power is turned off; otherwise, you run a high risk of radiation burns, which can damage body tissue.

- Even though you will be performing only limited maintenance on armed aircraft, be extremely careful when performing these duties. Observe and obey all armament warning signs. Be careful when using external power. Don't operate any armament switches or remove their safety devices. Before beginning work on armed aircraft, study the applicable aircraft technical manual to become familiar with the safety precautions.

- When working around ejection seats, be careful to avoid accidental arming and firing. High-level heat or movement of the actuating mechanisms can fire the ejection seat. Know how and where the safety pins are installed. Do not place tools in your pockets while working in the cockpit.

- Make sure that operating systems are clear of personnel and equipment when you are checking them. Have someone stand by to make sure that everyone stays clear of the danger areas. Aircraft with power-operated devices, such as flight control mechanisms and landing gear, present a possible danger. These devices are hydraulically operated. Careless operation can damage equipment and injure people.

- When repair work makes it necessary to walk or step on the aircraft, use the designated walkways. These are covered with nonskid material. You must not walk or step on areas designated as no-step

areas. Doing so could damage the aircraft, and you could slip and fall when stepping on slick surfaces.

- When using high-pressure air, be extremely careful. Air pressure strong enough to blow away dust or dirt is also strong enough to blow it into eyes and ears. Pressure as low as 10 to 15 psi has been known to cause serious injuries.

FIRE PREVENTION

Many fires are caused by carelessness and poor housekeeping. To prevent shop fires, observe the following precautions:

- Do not allow large quantities of rags to accumulate. Be sure that all oil rags are kept in approved, closed containers.
- Never smoke in areas marked with NO SMOKING signs.
- When your clothing becomes saturated with fuel or oil, change it as soon as possible. Besides being a fire hazard, clothing saturated with flammables may cause skin problems.
- Store combustible fluids in closed containers.
- Always make sure that static lines are in place and that the aircraft is properly grounded before working on it.
- Never deposit cigarettes or matches in a wastebasket even if they appear to be extinguished.
- Be careful with hydraulic fluid; it is not a highly flammable liquid but it will burn.
- Use only approved cleaning solvents.

Know the telephone number of the post fire department and the location of the fire extinguishers in the shop. See Table 12-1 for the types of fires that might occur and the extinguishers to be used on each.

CAUTION

THOUGH FIRE EXTINGUISHERS MAY LOOK ALIKE, THE EXTINGUISHING AGENTS INSIDE MAY VARY. A FIRE MAY BE MADE WORSE IF THE THE WRONG TYPE OF EXTINGUISHER IS USED.

Table 12-1. Types of Fire Extinguishers and Their Uses

TYPE OF EXTINGUISHER	TYPE OF FIRE	APPLICATION	EFFECTIVE RANGE	CHARACTERISTICS	WARNING
Pump tank	Type A fires: wood, trash, paper, waste.	Direct stream at base of flames.	.....	.....	Never use on charged electrical equipment, varnish, oils, or other fuels. Protect from freezing.
Soda acid	Type A fires: wood, trash, paper, waste.	Work close for penetration; direct stream at base of flames.	30 to 40 feet	Cools burning surfaces below ignition point. Any stream tends to smother flames.	Never use on charged electrical equipment, varnish, oils, or other fuels. Protect from freezing.
Foam type	Type B fires: gasoline, oil, oil-base materials, varnishes, wood, trash, and paper waste.	Apply complete blanket of foam over surface. Avoid a direct stream on oil surfaces.	30 to 40 feet	Blankets burning material with froth or foam, which excludes oxygen. Cools and insulates surface from heat. Blanket prevents flashbacks.	Never use on charged electrical equipment. Protect from freezing.
Carbon dioxide (CO_2)	Types A, B, and C fires: electrical fires, confined oil fires, ordinary combustibles.	Working with draft, apply so that gas floods material in a wave (extinguisher lasts only a few seconds).	3 to 6 feet	Flame is smothered by heavy blanket of nonflammable gas.	Avoid extended exposure in area where CO_2 has been used, especially in pits. CO_2 will not support life.
Chlorobromomethane	Type C fires: electrical and small fires.	Direct stream on base of fire or hot surface.	15 to 30 feet	Upon contact with flame or hot surface, converts into a heavy smothering vapor.	Do not use in closed areas. If liquid comes into contact with skin or eyes, wash immediately with water and get medical treatment immediately.